WHAT IS CLAIMED IS:

1	 A method for placing circuit elements into logic blocks, t 	he method			
2	comprising:				
3	assigning each of the circuit elements to a separate abstract block, wherein the				
4	circuit elements are part of a user design for a programmable integrated circuit;				
5	grouping each of the abstract blocks into a logic block;				
6	removing a first one of the abstract blocks from a logic block in response to				
7	placement information that indicates a design goal would be improved by rearranging at least				
8	a portion of the user design; and				
9	placing the first abstract block into a different logic block on the				
10	programmable integrated circuit.				
1	2. The method according to claim 1 wherein the design goal	lincludes			
2					
2	routability and signal timing in the user design.				
1	3. The method according to claim 1 wherein the circuit elem	nents include			
2	lookup tables and registers.				
1	4. The method according to claim 1 wherein the circuit elen	nents include			
2	 The method according to claim 1 wherein the circuit elements include OSP blocks and RAM blocks. 				
۷	DSF blocks and RAW blocks.				
1	5. The method according to claim 1 further comprising:				
2	determining whether placing each circuit element into the logic b	lock violates			
3	any of a set of design rules relating to the logic block, wherein the logic blocks	are grouped			
4	into clusters; and				
5	determining whether placing each of the circuit elements into a c	luster violates			
6	any of a set of design rules relating to the cluster.				
1	6. The method according to claim 5 wherein each of the abs	troot blooks			
1	S				
2	are grouped into a cluster based on an attraction of the abstract block to the cluster, and the				
3	attraction measures a number of nets and connections of nets absorbed into the cluster if the				
4	abstract block is placed inside the cluster.				
1	7. The method according to claim 5 wherein each of the abs	tract blocks			
2	are grouped into a cluster based on an attraction of the abstract block to the clus	ter, and the			

4	abstract block is placed inside the cluster.				
1	8. The method according to claim 5 further comprising:				
2	placing one of the abstract blocks into another logic block within the cluster if				
3	placing that abstract block into the logic block violates any of the design rules relating to the				
4	logic block; and				
5	placing one of the abstract blocks into another cluster if placing that abstract				
6	block into the cluster violates any of the design rules relating to the cluster.				
1	9. The method according to claim 1 wherein the logic blocks implement				
2	functions performed by two lookup tables with less than k unique input variables; and the				
3	method further comprises:				
4	determining whether placing each of the abstract blocks into the logic blocks				
5	causes any of the logic blocks to have more than k unique input variables.				
1	10. The method according to claim 1 wherein the placement information				
2	includes floorplanning information.				
1	11. The method according to claim 1 wherein the placement information				
2	includes partition information.				
1	12. The method according to claim 1 wherein the placement information				
2	includes data obtained by placing a portion of the user design on the programmable integrated				
3	circuit.				
1	13. The method according to claim 1 wherein:				
2	grouping each of the abstract blocks into a logic block further comprises				
3	grouping first and second abstract blocks into a first logic block;				
4	removing the first one of the abstract blocks from the logic block further				
5	comprises removing the first abstract block from the first logic block; and				
6	placing the first abstract block into a different logic block further comprises				
7	placing the first abstract block into a second logic block and placing the second abstract block				
8	into the first logic block.				

attraction measures a number of timing critical connections absorbed into the cluster if the

1	14. A computer program product stored on a computer readable medium				
2	for placing circuit elements in a user design for a programmable integrated circuit into logic				
3	blocks, the computer program product comprising:				
4	code for assigning each of the circuit elements to a separate abstract block;				
5	code for grouping each of the abstract blocks into a logic block;				
6	code for determining whether placement information indicates that a design				
7	goal would be improved by moving at least one of the abstract blocks into a different logic				
8	block; and				
9	code for removing the at least one abstract block from a first logic block and				
10	placing the at least one abstract block into a second logic block in response to the				
11	determination based on the placement information.				
1	15. The computer program product as defined in claim 14 wherein the				
2	design goal includes signal timing and routability in the user design.				
1	16. The computer program product as defined in claim 14 wherein the				
2	ogic blocks are grouped into clusters of logic blocks, and the code for grouping each of the				
3	abstract blocks into a logic block further comprises code for grouping each of the abstract				
4	blocks into a cluster of logic blocks based on an attraction of the abstract block to the cluster.				
1	17. The computer program product as defined in claim 16 further				
2	comprising:				
3	code for determining whether grouping the abstract blocks into the clusters				
4	violates any design rules of the clusters; and				
5	code for determining whether grouping the abstract blocks into the logic				
6	blocks violates any design rules of the logic blocks.				
1	19 The community was a defend in this 14 and a decimal to the second of				
1	18. The computer program product as defined in claim 14 wherein some of				
2	the circuit elements are lookup tables, and some of the circuit elements are registers.				
1	19. The computer program product as defined in claim 16 wherein the				
2	attraction measures a number of nets and connections of nets absorbed into the cluster if the				
3	abstract block is placed inside the cluster.				

1		20.	The computer program product as defined in claim 16 wherein the			
2	attraction mea	attraction measures a number of timing critical connections absorbed into the cluster if the				
3	abstract block	abstract block is placed inside the cluster.				
1		21.	The computer program product as defined in claim 17 further			
2	comprising:					
3		code fo	or placing one of the abstract blocks into another logic block if placing			
4	that abstract b	abstract block to the logic block violates any of the design rules relating to the logic				
5	block.					
1		22 .	The computer program product as defined in claim 17 further			
2	comprising:					
3		code fo	or placing one of the abstract blocks to another cluster if placing that			
4	abstract block to the first cluster violates any of the design rules relating to the first cluster.					
1		23.	The commutes are grown and dust or defined in claim 14 further			
1		23.	The computer program product as defined in claim 14 further			
2	comprising:					
3		code for determining whether placing the abstract blocks to the logic blocks				
4	causes any of the logic blocks have more than k unique input variables,					
5		wherein the logic blocks are configurable to implement functions performed				
6	by two lookup	by two lookup tables with less than k unique input variables.				
1		24.	The computer program product as defined in claim 14 wherein the			
	mlo a amount in fo					
2	piacement into	ormatio	n includes floorplanning information.			
1		25.	The computer program product as defined in claim 14 wherein the			
2	placement info	ormatio	n includes partition information.			
	1		1			
1		26.	The computer program product as defined in claim 14 wherein the			
2	placement info	lacement information includes data obtained by placing logic blocks that implement				
3	portions of the user design on the programmable integrated circuit.					